Monday, November 17, 2003

Sprint's Enterprise Voice Over IP

A simple, cost-effective solution for blending voice and data

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VoIP: Full Embrace by the Industry

- **Enterprise VoIP:** Incumbent carriers (AT&T, MCI, RBOCs) are the last stronghold of the circuit-switched telecom world. The fact that nearly all of them are now offering Enterprise VoIP services with an intent to match traditional Voice VPN capabilities is an indication that convergence is inevitable.

- **IP Telephony:** All traditional PBX vendors (e.g. Avaya, Nortel, Siemens, etc.) are now shipping IP-based systems while none of them announced a release of a new legacy system in 2002.

- **IP Centrex:** The commercial deployment of IP Centrex is picking up momentum. Service providers are starting to see the value proposition via the delivery of IP Centrex services.

"The customers will eventually migrate to IP Telephony/VoIP or ... Be pushed into it by the industry."

Sources: *Frost & Sullivan "World VoIP Services Market,"* 2002
VoiceCom2003, Feb. 2003.

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VoIP -- Strategic Technology

VoIP is **strategic technology** with the ability to support value-added voice services that cannot be effectively delivered with PSTN, such as unified messaging and multimedial applications. This and transport savings are seen as the major driving forces for VoIP.

Source: *Faulkner Information Services "VoIP Market Trends"* August, 2002

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Consensus: Next Revolution in Telecom is In Progress

1880's - late 60's
Analog Lines

late 60's - 2000
24 channel T1s

2000 -
IP

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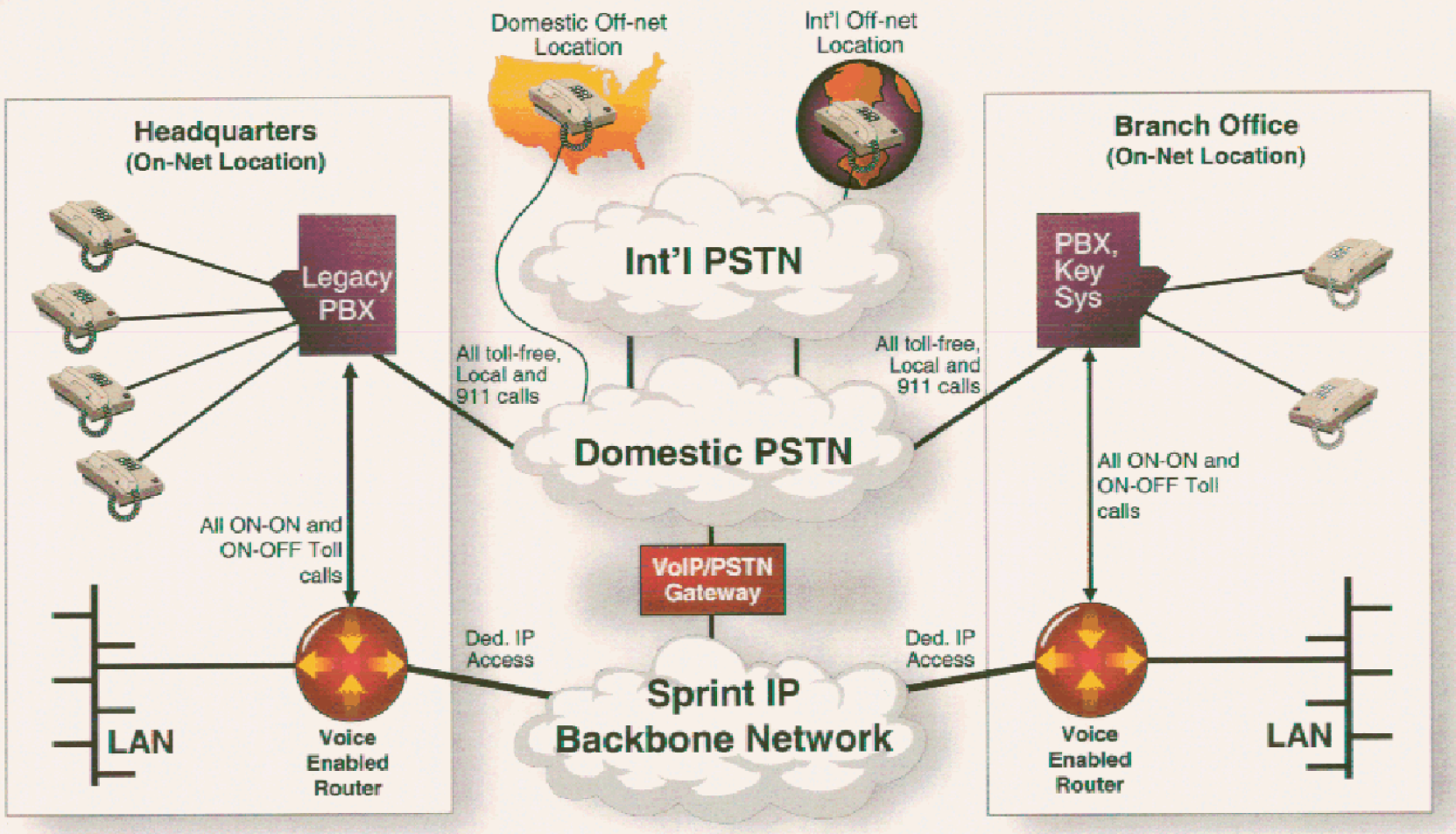
Sprint' Enterprise VoIP Service



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Benefits of Sprint's VoIP WAN Service

- **Preserves investment** in legacy PBXs and desktop phones while providing **LD savings** for On-net/On-net and On-net/Off-net calling
- Significantly **reduces access bandwidth**
  - *26.4Kbps (G.729A) per channel for voice only traffic*
  - *82.4Kbps (G.711) per channel for Fax support*
- Offers **additional savings through consolidation** of voice and data on the same Dedicated IP access link
- **Ensures enterprise quality** voice through Sprint-managed implementation and router management

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Sprint's VoIP WAN Services: Features

- On/On and On/Off support for legacy PBX; Only On/On support for IP-PBX.
- Domestic and International On-net locations
- On/On & On/Off calling for domestic locations
- On/On only calling for international locations
- Global On/Off dialing
- No Caller ID
- Customer defined abbreviated dialing
- CDR for On/Off calls is based on DMS 250
- Voice Enabled Cisco 26xx/36xx/37xx routers
- T1, E1, and Analog (i.e FXO, FXS, E&M) PBX interfaces
- T1 and E1 access to SprintLink
- Managed Services
  - *Managed router, Managed dial plan*
- SIP-based VoIP network

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Service Best Suited for....

- Customers that already have Sprint-provided dedicated IP service and MNS managed routers and who want to add voice to their data traffic in order to optimize available IP bandwidth.

- Saving money on On/On toll charges, especially on international routes, is the most often quoted reason for moving to Enterprise VoIP service.

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Sprint's VoIP WAN Services: SprintLink Advantage

- Over two decades of technology leadership in IP
- 100% native global IP backbone network
- Industry-leading SLAs and Classes of Service
- *Multi-Service Cisco Powered Network* (CPN) designation
- Simple network design
- Unmatched survivability
- Scalable architecture
- Proactive network monitoring
- Complete portfolio of IP-enabled solutions

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Cisco Powered Network

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Enterprise VoIP Performance

Average MOS score	3.81
calls below MOS 3.6	1.08%
calls below MOS 3.7	2.79%
calls with MOS 3.7-3.9	93.40%
Average Delay (headset-to-headset)	124ms
calls with delay below 150ms	99.87%
Call Completion Rate	99.87%

Configuration: T1 access to SprintLink; traffic composition -- all 24 voice channels active (41% of T1 bandwidth) plus data traffic with typical assortment of packet lengths (35% of T1 bandwidth); CoS enabled in Sprint Link and CPE router with the highest priority queue scaled for 45% of T1 bandwidth to ensure that all voice packet have priority; tests run coast-to-coast, KC to Reston and KC to Burlingame; voice quality is measured with PESQ and mapped into MOS.

Note: Customer experience with VoIP was also measured across CPE-based and Network-based IPVPN with nearly identical results. **The key message is that the voice can run equally well across dedicated IP and IPVPN**

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VoIP Standards: SIP vs. H.323

- **SIP is more than just a new standard; it is also acting as an enabling technology paving the way for user-defined communications, since it is basically a Web-friendly standard, much like HTTP.**

- **SIP is likely to have the greatest impact at the end-user level by helping to turn all end-points (i.e. phones) into smart devices. SIP enables multiple advanced features and services not possible on circuit-switched networks.**

- **H.323 remains the dominant VoIP standard in WAN, by far. There is practically no difference between the two standards as far as call management is concerned. H.323 is the incumbent protocol in most networks and there is no incentive to change it to SIP.**

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The Next Technological Frontier: VoIPVPN

- **Voice over IPVPN is a natural extension of VoIP. It differs from standard VoIP only in added requirement for encryption and the assumption of managed network.**

- **Improvements on the latency problems created by encryption can now create a secure feed in VPNs that makes it possible to extend the corporate PBX to the remote office using IP voice gateways.**

  — *A new generation of IP voice gear operating in conjunction with managed networks can now guarantee round trip coast-to-coast latency of 125 msec or less. This makes VoIPVPN a viable option.*

- **While On-net VoIPVPN is now technically ready, there are still technological barriers for Off/On and On/Off calling, ranging from QoS issues to incompatibilities among H.323-based systems.**

- **Sprint is currently testing VoIP across its network- and CPE-based IP VPN services to certify this application.**

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Sprint's VoIP LAN Services

Sprint's VoIP LAN offering combines Sprint services of design, implementation, transport, maintenance, and MNS wrapped around the leading VoIP equipment vendor CPE to provide customers with a project managed, turnkey solution.

In addition Sprint offers MNS for our VoIP LAN offering as an option.

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Sprint's VoIP LAN Services: Cisco AVVID

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- AVVID is Cisco's roadmap for IP based applications. VoIP is just the first application on AVVID platform. Much more to follow soon.
- Cisco AVVID replaces traditional PBX and provides the economy of a single technology organization to support both voice and data.
- It is widely accepted that IP-PBX (such Cisco AVVID) is an optimum alternative in "greenfield" and PBX replacement situations.

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Sprint's VoIP LAN Services: Nortel IGT/BCM

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- Meridian PBX's can be upgraded with IGT VoIP cards as a 'hybrid' system for gradual migration to a VoIP infrastructure. This solution preserves the initial investment in traditional PBX and phones.
- The BCM unit at smaller remote locations is an economical fully featured IP PBX.
- If the BCM unit replaces a NorStar key system, BCM can support both the existing digital handsets and IP handsets. Digital and IP handsets can have identical user interface.
- Nortel's alternative is ideal for situations where customer infrastructure is not yet ready for complete replacement but there is a high interest in taking advantage of VoIP.

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Enterprise VoIP Enhancements

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